

WHAT IS CLAIMED AS NEW AND IS DESIRED TO BE SECURED BY LETTERS  
PATENT OF THE UNITED STATES IS:

1. A method for obtaining lineage committed human cells with enhanced proliferative potential, biological function, or both; comprising culturing lineage committed human cells under physiologically acceptable liquid culture conditions, said conditions including replacement of the liquid culture medium at a rate and for a time sufficient to obtain human lineage committed cells with enhanced proliferative potential, biological function, or both.

2. The method of claim 1, wherein the human lineage committed cells comprise hematopoietic cells, mesenchymal cells, keratinocytes, fibroblasts, hepatocytes, neural cells, epithelial cells, lymphocytes, osteoblasts or human osteoclasts.

3. The method of claim 1, wherein the human lineage committed cells comprise stem cells, hematopoietic progenitor cells, mature myeloid cells, or stromal cells.

4. The method of claim 1, wherein the human lineage committed cells comprise dendritic cells or non-myeloid mature cells which are other than stromal cells.

5. The method of claim 1, wherein the human lineage committed cells comprise T-cells, dendritic cells or chondrocytes.

6. The method of claim 1, wherein a human hematopoietic cell composition enriched in human T-cells is cultured.

7. The method of claim 1, wherein the culture medium is continuously perfused at a ramped rate proportional to the lactate concentration and/or cell density to replace the culture medium without substantial dilution of the cell density.

8. The method of claim 1, wherein the culture medium is replaced at rate of from 50% to 100% daily replacement for a cell density of from  $1 \times 10^4$  to  $1 \times 10^7$  cells per ml of culture.

9. The method of claim 1, wherein the culture medium is replaced periodically or continuously.

10. The method of claim 1, wherein the cells are cultured for at least 2 days.

11. The method of claim 1, wherein the culture medium contains at least 1 growth factor which stimulates the proliferation of the cells.

12. The method of claim 1, wherein the cultured lineage committed human cells have enhanced replicative potential.

13. The method of claim 1, wherein the cultured lineage committed human cells have enhanced biological function.

14. The method of claim 1, wherein the cultured lineage committed human cells have enhanced replicative potential and biological function.

15. A composition comprising lineage committed human cells with enhanced proliferative potential, enhanced biological function, or both, as compared to the proliferative potential, biological function, or both, of the lineage committed human cells cultured under conditions which do not include replacement of the liquid culture medium during the culturing.

5 16. The composition of Claim 15, wherein the lineage committed human cells comprise hematopoietic cells, mesenchymal cells, keratinocytes, fibroblasts, hepatocytes, neural cells, epithelial cells, lymphocytes, osteoblasts or human osteoclasts.

17. The composition of Claim 15, wherein the lineage committed human cells comprise stem cells, hematopoietic progenitor cells, mature myeloid cells, or stromal cells.

10 18. The composition of Claim 15, wherein the lineage committed human cells comprise dendritic cells or non-myeloid mature cells which are other than stromal cells.

19. The composition of Claim 15, wherein the lineage committed human cells comprise T-cells, dendritic cells or chondrocytes.

15 20. A composition comprising lineage committed human cells with enhanced proliferative potential, enhanced biological function, or both, which is obtained by the method according to claim 1.

21. A composition comprising lineage committed human cells with enhanced proliferative potential according to claim 15.

20 22. A composition comprising lineage committed human cells with enhanced biological function according to claim 15.

23. A composition comprising lineage committed human cells with enhanced proliferative and enhanced biological function according to claim 15.

24. A method for treating a human patient in need of an infusion of lineage committed human cells, comprising administering to said patient a composition according to claim 15.

25. A method for treating a human patient in need of an infusion of lineage committed human cells, comprising administering to said patient a composition according to claim 16.

5 26. A method for treating a human patient in need of an infusion of lineage committed human cells, comprising administering to said patient a composition according to claim 17.

27. A method for treating a human patient in need of an infusion of lineage committed human cells, comprising administering to said patient a composition according to claim 18.

10 28. A method for treating a human patient in need of an infusion of lineage committed human cells, comprising administering to said patient a composition according to claim 19.

29. A method for treating a human patient in need of an infusion of lineage committed human cells, comprising administering to said patient a composition according to claim 20.

30. A method for treating a human patient in need of an infusion of lineage committed human cells, comprising administering to said patient a composition according to claim 21.

15 31. A method for treating a human patient in need of an infusion of lineage committed human cells, comprising administering to said patient a composition according to claim 22.

32. A method for treating a human patient in need of an infusion of lineage committed human cells, comprising administering to said patient a composition according to claim 22.

20 33. A method for obtaining lineage committed human cells with enhanced proliferative potential, comprising culturing lineage committed human cells under physiologically acceptable liquid culture conditions, said conditions including replacement of the liquid culture medium at a

rate and for a time sufficient to obtain human lineage committed cells with enhanced proliferative potential.

34. The method of claim 33, wherein the human lineage committed cells comprise hematopoietic cells, mesenchymal cells, keratinocytes, fibroblasts, hepatocytes, neural cells, epithelial cells, lymphocytes, osteoblasts or human osteoclasts.

35. The method of claim 33, wherein the human lineage committed cells comprise stem cells, hematopoietic progenitor cells, mature myeloid cells, or stromal cells.

36. The method of claim 33, wherein the human lineage committed cells comprise dendritic cells or non-myeloid mature cells which are other than stromal cells.

37. The method of claim 33, wherein the human lineage committed cells comprise T-cells, dendritic cells or chondrocytes.

38. A method for obtaining lineage committed human cells with enhanced biological function comprising culturing lineage committed human cells under physiologically acceptable liquid culture conditions, said conditions including replacement of the liquid culture medium at a rate and for a time sufficient to obtain human lineage committed cells with enhanced biological function.

39. The method of claim 38, wherein the biological function enhanced in the cultured cells comprises at least one member selected from the group consisting of secretion of substances, cell-cell communication, receptor expression on the cell surface, cytolysis, antigen presentation, antigen processing, ability to home *in vivo* to sites for function, and the ability to proliferate leading to development/regeneration of tissue similar to naturally occurring

structure/function.

40. The method of claim 38, wherein the biological function enhanced in the isolated lineage committed human cells comprises increased release of cytokines.

41. The method of claim 38, wherein the biological function enhanced in the isolated lineage committed human cells comprises increased cytolytic activity.

42. The method of claim 38, wherein the human lineage committed cells comprise hematopoietic cells, mesenchymal cells, keratinocytes, fibroblasts, hepatocytes, neural cells, epithelial cells, lymphocytes, osteoblasts or human osteoclasts.

43. The method of claim 38, wherein the human lineage committed cells comprise stem cells, hematopoietic progenitor cells, mature myeloid cells, or stromal cells.

44. The method of claim 38, wherein the human lineage committed cells comprise dendritic cells or non-myeloid mature cells which are other than stromal cells.

45. The method of claim 38, wherein the human lineage committed cells comprise T-cells, dendritic cells or chondrocytes.

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